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## Peer Support Intervention's Impact on Glycemic Control Among Type 2 Diabetes Mellitus Patients

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### Abstrak

Beberapa model telah dikembangkan untuk mendukung manajemen mandiri pasien untuk mengontrol glukosa darahnya. Intervensi peer support diyakini berdampak positif pada pengendalian glikemik pada penderita diabetes melitus tipe 2. Tujuan dari tinjauan literatur ini adalah untuk mengidentifikasi efek dari beberapa intervensi peer support pada kontrol glikemik di antara orang dewasa dengan diabetes mellitus tipe 2. Pencarian literatur secara integratif dilakukan di basis data elektronik seperti PubMed, CINALH, dan Cochrane. Kriteria inklusi penelitian yang ada di tinjauan literatur ini adalah penelitian dengan intervensi peer support, menggunakan desain randomized control trial pada pasien dengan diabetes mellitus tipe 2, kontrol glikemik sebagai hasil, menggunakan bahasa Inggris, diterbitkan dalam 10 tahun terakhir, dan tersedia dalam teks lengkap dan gratis. Tujuh penelitian memenuhi kriteria inklusi dan dimasukkan dalam analisis lebih lanjut. Lima studi melaporkan intervensi peer support secara statistik signifikan untuk meningkatkan kontrol glikemik melalui penurunan tingkat HbA1c. Intervensi peer support jangka pendek memberikan manfaat potensial pada kontrol glikemik.

**Kata Kunci:** diabetes mellitus tipe 2; intervensi peer support; control glikemik

### Abstract

Several models have been developed to provide support for patient self-management to control their blood glucose. Peer support intervention believed to bring positive impact on glycemic control in patient with type 2 diabetes mellitus. The aim of this review was to identify the effect of several peer support interventions on glycemic control among adult with type 2 diabetes mellitus. An integrative search was conducted in electronic databased Pub Med, CINALH, and Cochrane. The inclusion criteria of studies included were employed peer support intervention, randomized control trial in patient with type 2 diabetes mellitus, glycemic control as outcome, English language, published in last 10 years, and available in free full text. Seven studies met the inclusion criteria and included in the further analysis. Five studies reported peer support intervention found statistically significant to improve glycemic control through decreasing HbA1c level. Short term peer support intervention provide potential benefit on glycemic control.

**Keywords:** type 2 diabetes mellitus, peer support intervention, glycemic control

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## INTRODUCTION

Diabetes mellitus is a chronic disease that need complex and various strategies to control blood sugar level (1). The prevalence and incidence of diabetes mellitus continues growing and confirm as global health emergencies. In 2019, around 463 million people had diabetes mellitus and estimated increase to 700 million in 2045 (2). Majority of diabetes patients are aged over 60 years in developing countries. While diabetes patients in developed countries are aged between 40 and 60 years (3).

Education on diabetes and standardized self-management of patients are still the basis of diabetes control (4). Self-management consist of meal planning, structured physical activity, self-monitoring blood glucose, diabetes medication, and managing hypoglycaemia and hyperglycemia (1). Diabetes self-management education (DSME) continuously provides diabetes patients with the knowledge, skills, and ability that improve health outcome such as HbA1c, LDL level, and blood pressure level (5). DSME for groups of diabetes patients could be provided by doctors or nurses (6). However studies reported the outcomes of DSME sustained around 12 months after intervention (7,8) and need adequate health care personnel (9).

In order to assist ongoing self-management in patients with type 2 diabetes mellitus, peer support intervention having potential benefit in diabetes care since it improve glycemic control (10). Peer support define as people who has knowledge in term of specific behavior and or stressor and similar characteristic as target population (11). Previous studies reported peer support intervention effective for maintain medication adherence in people with HIV (12) and improve breast cancer patients' quality of life, emotion (13). Therefore, it has been hypothesized that peer support could be promising intervention for patients with type 2

diabetes mellitus. Consequently, we conducted a integrative review of RCTs to determine the effect of peer support intervention on glycemic control among patients with type 2 diabetes mellitus.

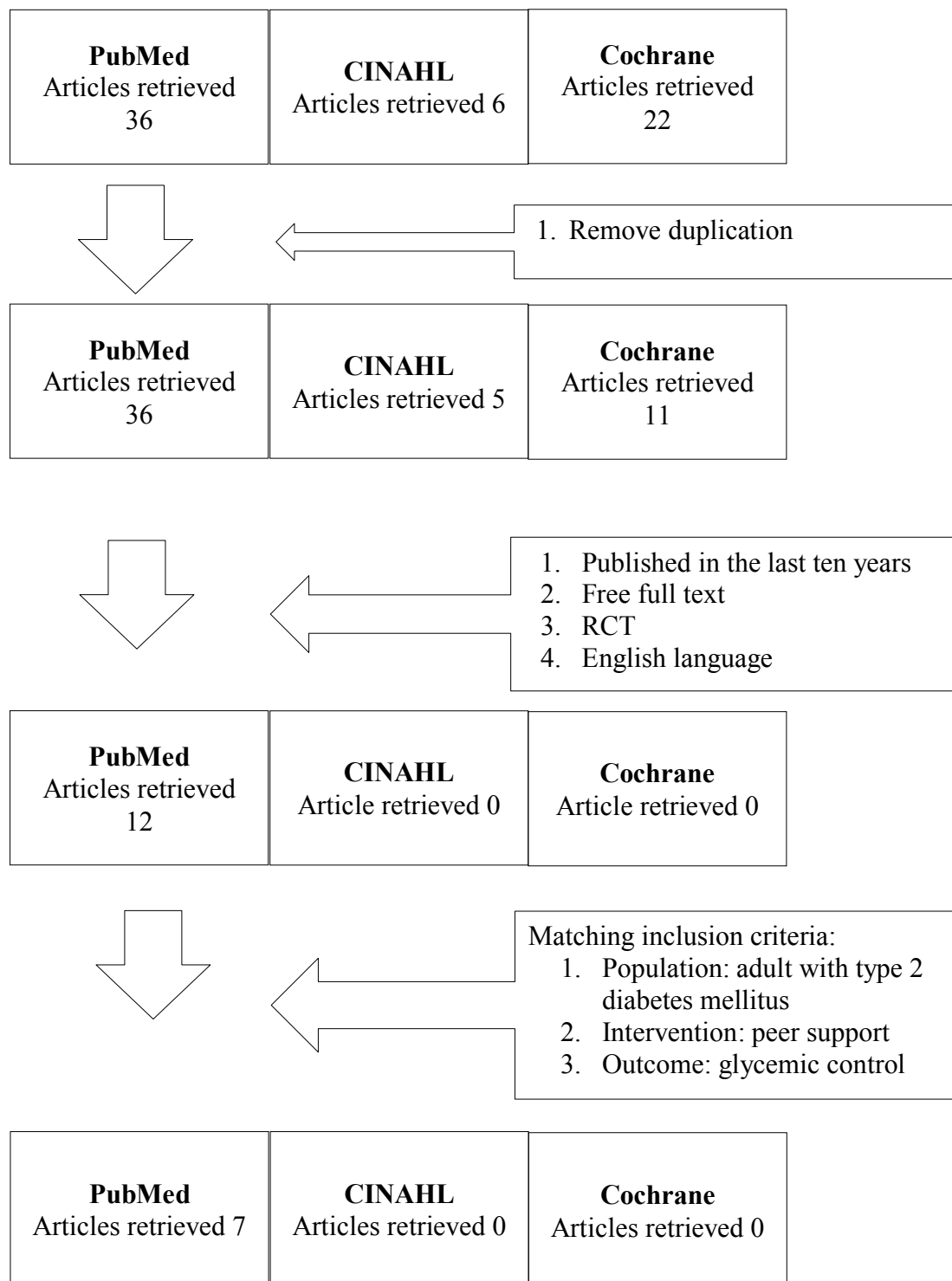
## MATERIALS AND METHODS

This study was an integrative literature review to analyze the relevant studies to identify the effect of several peer support interventions on glycemic control among adult with type 2 diabetes mellitus. The process of searching relevant studies was performed in September 2020. The keywords used in this review are "adult with type 2 diabetes mellitus", "peer support", "glycemic control". Database search was done in 3 main databases including PubMed, CINAHL and Cochrane. Based on database search process, we found several articles: 35 from PubMed, 6 articles from CINAHL, and 22 articles from Cochrane. Then, we removed the duplication of the articles. Studies considered eligible for review if they met the following inclusion criteria: articles with randomized control trial, published in the last 5 years, English language, adult with type 2 diabetes mellitus, peer support performed as intervention, reported the evaluation of HbA1c level as indicator for glycemic control. Totally, seven articles found from PubMed, 0 articles from CINAHL, and 0 article from Cochrane (Figure 1).

## RESULTS AND DISCUSSION

### Study Design

Seven published experimental studies reviewed to determine existing studies about the peer support intervention to improve glycemic control in patients with type 2 diabetes mellitus. Studies selected published in 2011 to 2018. The details of included studies, in term of characteristic of the study (author, year of publication, title, participants, intervention and results) are presented in Table 1. Four trials conducted in the United States (14–17), one



**Figure 1. Flow chart of search strategy and result**

in China (18), one in Austria (19), and one in Africa (20). The total respondents of the studies ranged from 104 to 337 patients. The duration of the intervention ranged from three to twenty four months. The mean of the HbA1c at baseline in peer group intervention participants ranging from 7.02 % - 10.6%. All of the peer support

intervention conducted in group of patients with type 2 diabetes mellitus.

### **Intervention Characteristics**

#### ***Recruitment and Training of Peer Support***

The criteria of the peer support were patients with type 2 diabetes mellitus who had

**Table 1. Summary of The Selected Studies Including Author, Year of Publication, Intervention, and Result**

No	Author/Year	Title	Participants	Intervention	Average of HbA1c at baseline (%) (intervention and usual care)	Result
1	Spencer, M. S., Kieffer, E. C., Sinco, B., Platt, G., Palmisano, G., Hawkins, J., ... & Heisler, M/2018).	Outcomes at 18 Months From a Community Health Worker and Peer Leader Diabetes Self-Management Program for Latino Adults	CHW-only intervention (n = 89), the CHW+PL intervention(n=60) groups, the EUC (n = 73)	All participants in the PL intervention completed the CHW intervention from baseline to 6 months and then were randomized to participate in the PL intervention. The PL intervention was designed to provide patients with ongoing emotional and behavioral support	EUC = 7.7 CHW = 7.7 CHW+PL = 8.2	From 6 to 12 months, improvements in HbA1c control were sustained for participants randomized to the CHW+PL group
2	Debussche, X., Besançon, S., Balcou-Debussche, M., Ferdynus, C., Delisle, H., Huiart, L., & Sidibé, A. T/2018	Structured peer-led diabetes selfmanagement and support in a low income country: The ST2EP Randomized controlled trial in Mali	peer-led structured patients education (n = 76) or conventional care alone (n = 75)	The intervention group received 1 year of culturally tailored structured patient education (3 courses of 4 sessions) delivered in the community by five trained peer educators. Both groups underwent conventional diabetes monitoring and follow-up	Conventional care = 10.8 Peer led group = 10.6	From baseline to 12 months, the decrease in HbA1c levels was 1.05% in the intervention group
3	Deng, K., Ren, Y., Luo, Z., Du, K., Zhang, X., & Zhang, Q/2016	Peer support training improved the glycemic control, insulin management, and diabetic behaviors of patients with type 2 diabetes in rural communities of Central China: a randomized controlled trial.	Traditional training group (control group, n=111) and peer support intervention group (peer group, n=97)	Both groups received 3-month traditional training, followed by another 4-month traditional training or peer support training	Traditional care group = 8.43 peer group = 8.45	peer group patients achieved a more significant decrease in blood glycosylated hemoglobin levels (P<0.05)
4	Johansson, T., Keller, S., Winkler, H., Ostermann, T., Weitgasser, R., & Sönnichsen, A. C/2016	Effectiveness of a Peer Support Programme versus Usual Care in Disease Management of Diabetes Mellitus Type 2 regarding Improvement of Metabolic Control: A Cluster-Randomised Controlled Trial	intervention: 148 in 19 clusters; control: 189 in 20 clusters	The peer support intervention ran over 24 months and consisted of peer supporter recruitment and training, and group meetings weekly for physical exercise and monthly for discussion of diabetes related topics	Control group = 7.08 Peer group= 7.02	peer support intervention as an additional DMP component showed no significant effect on HbA1c
5	Tang, T. S., Funnell, M. M., Sinco, B., Spencer, M. S., & Heisler, M/2015	Peer-led, empowerment-based approach to self-management efforts in diabetes (PLEASED): a randomized controlled trial in an African American Community	54 patients allocated to PLEASED intervention and 54 patients allocated to control group	a 3-month diabetes self-management education (DSME) program followed by a 12-month peer support intervention with a 3-month DSME program alone	Control group = 8.0 Peer-led group= 7.8	an initial DSME program, whether or not followed by 12 months of peer support, had no effect on glycoemic control
6	Moskowitz, D., Thom, D. H., Hessler, D., Ghorob, A., & Bodenheimer, T/2013	Peer coaching to improve diabetes self-management: which patients benefit most?	usual care (n=151); Intervention (n=148)	Peer coaches interacted in person with the patients they coached either outside the clinic by telephone or during a clinic visit. Target goals for coaching sessions were telephone contact at least twice a month and 2 or more in-person contacts over 6 months. Coaches helped patients design action plans to achieve goals chosen by the patients	Usual care =9.8 Peer group = 10.1	Peer health coaching had a larger effect on lowering A1c in patients with low levels of medication adherence and self-management support than in patients with higher levels
7	Phillis-Tsimikas, A., Fortmann, A., Lleva-Ocana, L., Walker, C., & Gallo, L. C/2011	Peer-Led Diabetes Education Programs in High-Risk Mexican Americans Improve Glycemic Control Compared With Standard Approaches	104 patients Project Dulce peer-education group and 103 patients control group	participants randomly assigned to the Project Dulce group (n = 104) received usual care and attended eight weekly, 2-h diabetes self-management classes and subsequent monthly support groups, led by a trained peer educator	Control group = 10.3 Peer group = 10.5	Project Dulce peer-education intervention had significant effect on HbA1c (p= 0.02)

well controlled blood glucose and knowledge about diabetes, the willing to participate to assist other patients. Peer supports who met the criteria received workshop and training before they delivering the educational session for the respondents. The duration of the training session ranged from 8 to 46 hours. One study did not reported any detail of the background of the peer supporters and training material (15). The content of training for peer supports specifically related diabetes information such as diabetes self-management, complication risk management, navigate the health care, and how to provide motivation support to the respondents. The peer support trained by nurses staff (18), general practitioner, psychologist, nutritionist, sport scientist(19), and community health worker(14). The key element need to be considering are rigorous process of recruiting, selecting, and training the peer support.

### **Intervention Modes**

There were 2 modes of intervention such as face to face course session and face to face course session with additional telephone support call. The additional telephone contact performed to made regular contact with respondents who had not attended 3 consecutive educational session (14). The involvement of the respondents and the peer support plays significant role in achieving the goal of each study. The high frequency of peer support contact with the respondents significantly improve glycemic control (10). It means the intensive intervention should be implemented.

### **Effect of intervention on glycemic control**

Glycemic control is a factor that determine diabetes complication since the risk of complication correlated with glucose control level (21,22). Study reported patients with controlled HbA1c level lower in risk of microvascular, macro vascular complication and even the death

(23,24). The impact of peer support on glycemic control among intervention group presented in table 1. Two studies reported no significant effect of peer support in HbA1c reduction (15,19). The intervention conducted in those studies run 15 months and 24 months. It highlighted that the intervention should be performed in short term period to gain better outcome particularly HbA1c reduction.

### **CONCLUSION AND RECOMMENDATION**

Our study concluded peer support intervention provide potential benefit on glycemic control. The short term duration of the intervention should be considered once this intervention will be implemented. Considering most of the study included implemented in USA, the efficacy of peer support need to be explored in different area.

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